Continued from page 7

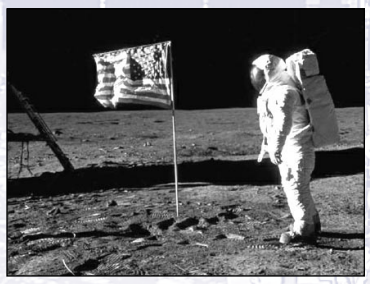
JSC celebrates 40 years

in the Russian Flight Control Room in Korolev, Russia, a Moscow suburb.

The ISS presented new challenges. It is a multinational program with partners from around the globe. Many of these partners participate in the planning and execution of real-time operations. Thus people in the Mission Control Center must interface with their counterparts located in control centers around the world. The Spaceflight Control Center in Korolev is where the Russian flight controllers support operations of the Russian elements of the space station.

The Triumph of Apollo

Apollo was a feat of modern technology. Apollo 8 expedited the journey to the moon. Scheduled to be the first human Apollo launch by a Saturn V, Apollo 8 was originally scheduled to test the manned Lunar Module in an Earth orbit. Changing it to a translunar mission marked a giant step in NASA's lunar landing drive.



NASA JSC S11-40-5875

On July 16, 1969, Apollo 11 left Earth for a mission to land men on the moon. As Apollo orbited the moon, the Lunar Module, known as the "Eagle" by its two crewmembers, Armstrong and Edwin Aldrin, separated nicely from the mother ship on the back side of the moon. But when the Command Module cleared the moon and communications resumed with Mission Control, communications and telemetry between the MCC in Houston and Apollo were bad.

At this point Mission Control had about five minutes in which to decide whether or not to abort the lunar landing. Then, with the Lunar Module four minutes away from its landing, the crew discovered that its altimeter and velocity gauges were in error. Those problems were corrected. Next the crew reported a computer alarm. A quick flight control analysis resulted in a decision to continue. But as the Eagle prepared to set down, Armstrong was forced to override the planned landing site to avoid rocky and dangerous terrain. The Eagle did land with less than 30 seconds of fuel remaining. For a time, due to unanticipated irregularities of the lunar gravitational field, NASA did not know precisely where.

For many who worked at JSC in April 1970, the flight of Apollo 13 will never be forgotten. Never before had the hostility of space been so starkly evident and the threat of catastrophe so imminent.

The flight was launched on April 11, 1970. Disaster struck on April 13. The spacecraft had reached 85 percent of the distance to the moon when an oxygen tank exploded, wiping out the main supply of life-sustaining oxygen and power. People all over the world responded to the plight of the three astronauts in the crippled spacecraft.

The astronauts moved out of the stricken Command Module and into the cramped quarters of the Lunar Module. The Lunar Module, built for the short trip for two people to land on the moon, would serve as the lifeboat for a four-day journey for three people. Using the Lunar Module's descent engine for propulsion, the crew looped the spacecraft around the moon and headed home.

While each element of the rescue was carefully planned and carried out, the crew battled cold, fatigue and physical discomfort. The Lunar Module's 49.5 hours of life support for two people had to be stretched to 84 hours for three people. With guidance from JSC spacecraft experts and life-support engineers, the Apollo 13 astronauts jury-rigged marvels of ingenuity for survival.

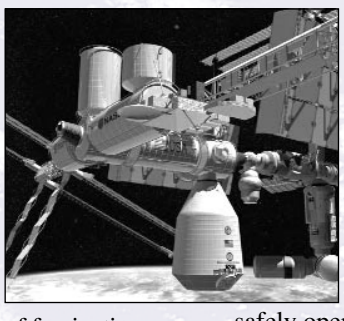
After splashdown in the Pacific Ocean on April 17, Apollo 13 was called a brilliant demonstration of the human capability under almost unbearable stress. At JSC it was known by many as "the finest hour."

"I look back on Apollo 13 as an ultimate test of all of our capabilities," said Apollo Flight Director Glynn Lunney. "The circumstances surrounding the explosion presented the team with a situation which had almost only one unique scenario for success out of a large set of other possibilities. Success was due to the tremendous teamwork of talented people integrated into a very powerful problem-solving team of operators, flight controllers and crews-engineering, program office personnel and contractor teams throughout the country."

The Apollo Program came to an end in 1972. By that time, astronauts had extended the range and scope of their lunar explorations.

Expanding the Center's Role

Whereas space flights through Apollo 11 concentrated on development and operations, later Apollo missions, then Skylab and, more recently and to an even greater extent, space shuttle and ISS flights have focused on operations, science and applications. Reorganizations of the center's directorates in the early 1970s denoted the rising significance of science and applications in space flight programs. The Lunar Samples Office, a Planetary and Earth Sciences Division and a separate Earth Observations Aircraft Program Office sprung up across the center. Today, JSC remains NASA's repository for lunar samples and its home for the study of the science and medicine of space flight.



From the first moon rocks of the late 1960s to today's Martian meteorites, JSC scientists have led the way in the study of fascinating rocks to better understand how our solar system, and perhaps life itself, came into being. The curators of these Apollo moon rocks and Antarctic meteorites are preparing for the return of samples by two current NASA missions: Genesis will collect samples of the solar wind and Stardust will return samples of Comet Wild 2. Meanwhile, the team is developing plans to bring home samples of Martian soil and rocks to continue the search for life beyond Earth.

From the beginnings of the space program, flight surgeons and life sciences researchers have played an important role in the human space flight team. Flight surgeons helped select the first astronauts and worked with them to better understand how the human body would react to space travel.

For more than 40 years, astronauts, in cooperation with life scientists, have studied adaptation to space. One of the three objectives of the Mercury Program was to observe human performance during launch, Earth orbit and landing. What began with the first EKG transmitted from Sheperd's Mercury capsule became weeklong medical experiments aboard the space shuttle and today's continuing, in-depth scientific investigations aboard the International Space Station.

Several physicians have themselves become astronauts. In 1965, Dr. Joseph "Joe" Kerwin was among those selected as part of the first group of scientist-astronauts. He was joined two years later by Drs. Donald Holmquest, Story Musgrave and William Thornton.

"Over the last 40 years, the efforts of NASA's life sciences researchers have led to a better understanding of human reaction to living in the space environment and to the development of countermeasures to overcome the negative aspects of living in the space environment," said Dr. Sam Pool, assistant director for space medicine in JSC's Office of Bioastronautics. "Today's life scientists perform peer-reviewed research to help astronauts not only live in space, but thrive there. Research into the neurological system, the cardiovascular system, nutrition, and bone density are just a few of the many important areas of research to ensure humans will be fully prepared for our next journey – the exploration of our solar system."

The Next 40 Years

Scheduled for completion about 2006, the International Space Station will have a mass of about 1,040,000 pounds. It will measure 356 feet across and 290 feet in length, with almost an acre of solar panels to provide electrical power to six laboratories.

The ISS will establish an unprecedented state-of-the-art laboratory complex in orbit. Research in the station's six laboratories will lead to discoveries in medicine, materials and fundamental science that will benefit people all over the world. JSC's role is to assure that the ISS vision is successful.

For the next 20 years, the center's focus will be on safely operating the space station with America's international partners. Whether future space missions will see human beings travel back to the moon, on to Mars or both, the ISS will serve as a stepping-stone to future destinations in the universe. ■

For a complete history of JSC, visit:
www.jsc.nasa.gov/pao/public/history

In the beginning

continued

I worked in the Wind Tunnel section at the Marshall Space Center in Huntsville when I heard the announcement about the MSC. My family had just returned from a trip to Fort Walden, Fla., where the Gulf is so beautiful. Thinking the Gulf must be the same all around its perimeter, I immediately submitted an application to the Space Task Group for a transfer. I was accepted and instructed to move to Langley, Va., and travel with the group to Houston in about four weeks. I argued to move directly to Houston and wait on the main body from Langley. My first office was in the Rich Building on Telephone Road. It was very lonely for several weeks. We raced down to see the mud flats of Galveston! I was assigned to the Apollo Pad-Abort flights out of White Sands as an Instrumentation engineer. I worked under Max Faget.

John Overton

I joined NACA in 1948. When I returned from my "Navy tour of duty" in 1955, I began working at Langley Field, Va., Wallops Island, Va., Ft Bragg, N.C., and Huntsville, Ala., on tasks related to the Mercury Project. In 1960, I was notified that I had been assigned to a group that would be going to a new center, which would be named later. My main concern was how it would affect my wife and three children.

Paul A. Folwell

I started in the Space Task Group on Dec. 7, 1959. I was in the thermal group with 12 others. Started on Mercury, Gemini, etc. I came from North American Aviation in Columbus, Ohio, and when we came to Newport News, Va., the houses were smaller and it was a step down. When the news came about moving to Houston we didn't know anything about it. Work was busy and we looked at literature and felt it was another venture to challenge. We got a trip to come down to Houston and look the place over and it was an exciting time. The move took place and we did our work and we got the spacecraft off the ground. I worked with developing all of the heat shields and I retired in 1993 with 34 years tenure.

James E.Pavlosky

The news that we were to move from Virginia to Texas did not disturb my wife and myself as much as it perhaps did to those that were native Tide Water Virginians, for after all, it was only two-and-a-half years since we had been uprooted and left Canada to come and work in the US Manned Space Program. Texas was unfamiliar territory to us – we had traveled to other parts of the U.S., but had never ventured to Texas (too hot, we were told)!

The rumors were rampant – hot, sticky weather, mosquitoes, rattlesnakes and dubious politics! But we came anyway, as it was the job we had signed on for, and I was deeply committed on the Mercury and Gemini programs. My first visit was shortly after hurricane Carla had hit the Clear Lake area, and I must confess, I wondered "What on earth are we doing coming to this place?" But, after being here a while, and especially after discovering the Texas Hill Country, we were convinced, and now, after many years here, we are enjoying retirement in the beautiful Hill Country at Wimberley.

Rod Rose
(NASA 1959-1984)

SPACE CENTER Roundup

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